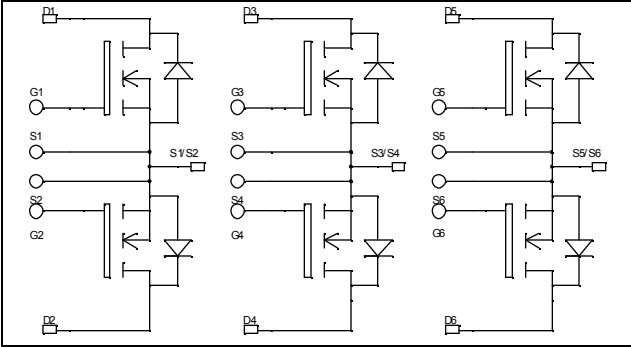


Triple dual common source MOSFET Power Module

$V_{DSS} = 100V$
 $R_{DSon} = 9m\Omega \text{ typ @ } T_j = 25^\circ C$
 $I_D = 139A \text{ @ } T_c = 25^\circ C$

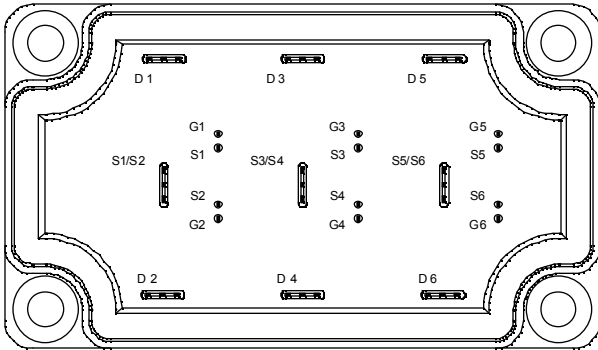


Application

- AC Switches
- Switched Mode Power Supplies
- Uninterruptible Power Supplies

Features

- Power MOS V[®] MOSFETs
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Avalanche energy rated
 - Very rugged
- Kelvin source for easy drive
- Very low stray inductance
 - Symmetrical design
 - Lead frames for power connections
- High level of integration




Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Very low (12mm) profile
- Each leg can be easily paralleled to achieve a dual common source configuration of three times the current capability
- RoHS Compliant

Absolute maximum ratings

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	100	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	139
		$T_c = 80^\circ C$	100
I_{DM}	Pulsed Drain current	430	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	10	$m\Omega$
P_D	Maximum Power Dissipation	$T_c = 25^\circ C$	390
I_{AR}	Avalanche current (repetitive and non repetitive)	100	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	3000	


CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com

All ratings @ $T_j = 25^\circ\text{C}$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS} = 0V, V_{DS} = 100V$ $T_j = 25^\circ\text{C}$			100	μA
		$V_{GS} = 0V, V_{DS} = 80V$ $T_j = 125^\circ\text{C}$			500	
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10V, I_D = 69.5A$		9	10	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 2.5\text{mA}$	2		4	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$			± 100	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1\text{MHz}$		9875		pF
C_{oss}	Output Capacitance			3940		
C_{rss}	Reverse Transfer Capacitance			1470		
Q_g	Total gate Charge	$V_{GS} = 10V$ $V_{Bus} = 50V$ $I_D = 139A$		350		nC
Q_{gs}	Gate – Source Charge			60		
Q_{gd}	Gate – Drain Charge			180		
$T_{d(on)}$	Turn-on Delay Time	Inductive switching @ 125°C $V_{GS} = 15V$ $V_{Bus} = 66V$ $I_D = 139A$ $R_G = 5\Omega$		35		ns
T_r	Rise Time			70		
$T_{d(off)}$	Turn-off Delay Time			95		
T_f	Fall Time			125		
E_{on}	Turn-on Switching Energy	Inductive switching @ 25°C $V_{GS} = 15V, V_{Bus} = 66V$ $I_D = 139A, R_G = 5\Omega$		552		μJ
E_{off}	Turn-off Switching Energy			604		
E_{on}	Turn-on Switching Energy	Inductive switching @ 125°C $V_{GS} = 15V, V_{Bus} = 66V$ $I_D = 139A, R_G = 5\Omega$		608		μJ
E_{off}	Turn-off Switching Energy			641		

Source - Drain diode ratings and characteristics

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit	
I_S	Continuous Source current (Body diode)		$T_c = 25^\circ\text{C}$			139	A
			$T_c = 80^\circ\text{C}$			100	
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = -139A$			1.3	V	
dv/dt	Peak Diode Recovery ①				5	V/ns	
t_{rr}	Reverse Recovery Time	$I_S = -139A$ $V_R = 66V$ $di_s/dt = 100A/\mu\text{s}$	$T_j = 25^\circ\text{C}$		270	ns	
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$		2.9	μC	

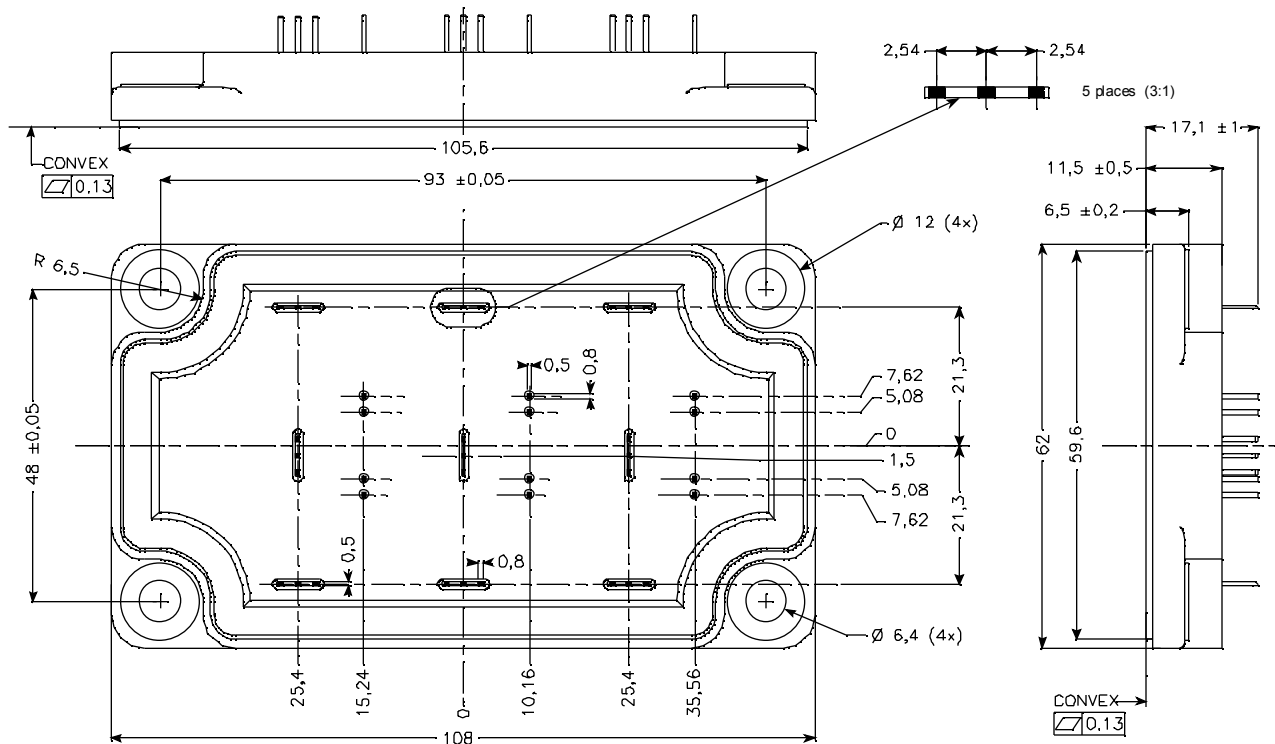
 ① dv/dt numbers reflect the limitations of the circuit rather than the device itself.

$$I_S \leq -139A \quad di/dt \leq 700A/\mu\text{s} \quad V_R \leq V_{DSS} \quad T_j \leq 150^\circ\text{C}$$

Thermal and package characteristics

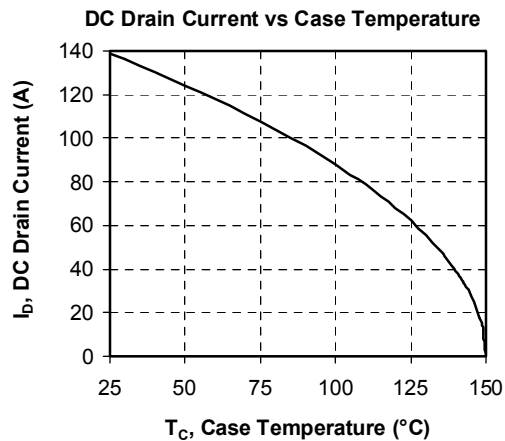
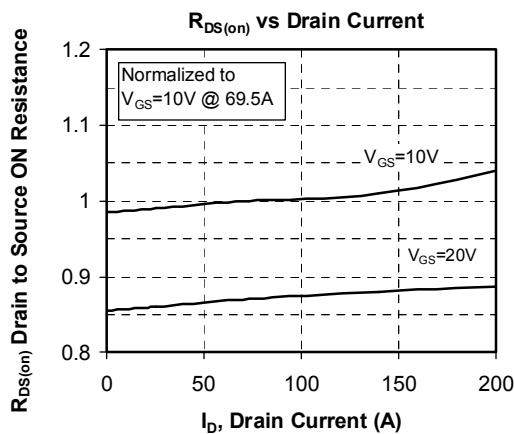
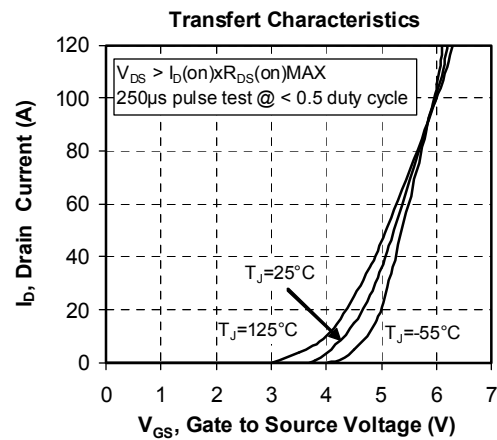
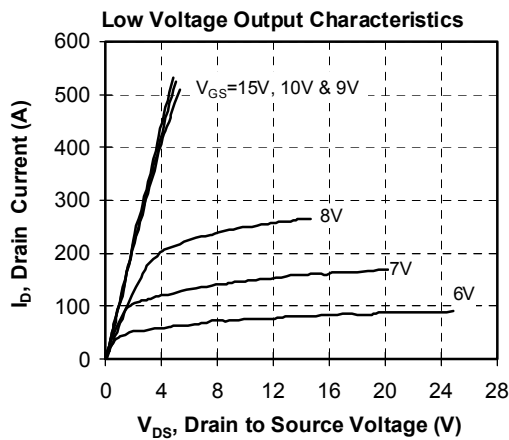
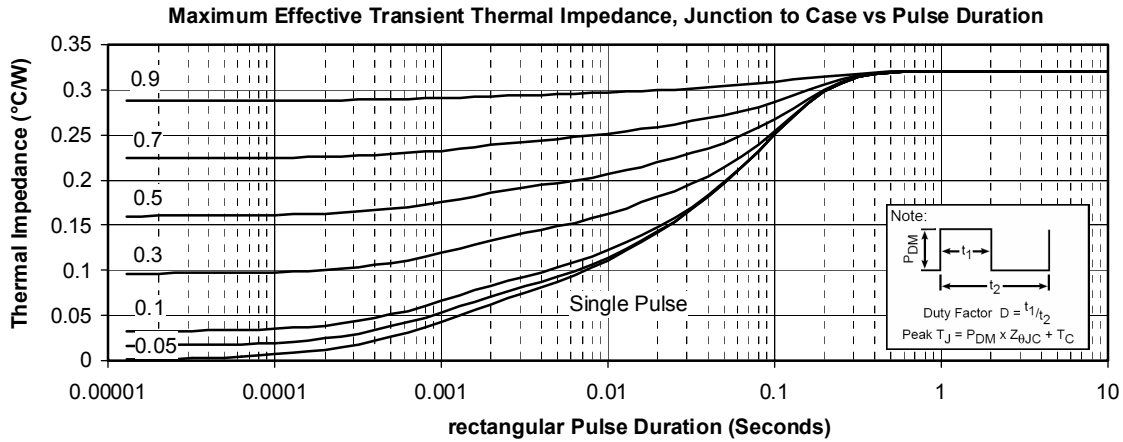
Symbol	Characteristic	Min	Typ	Max	Unit	
R_{thJC}	Junction to Case Thermal Resistance			0.32	°C/W	
V_{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, I _{isol} <1mA, 50/60Hz	2500			V	
T_J	Operating junction temperature range	-40		150	°C	
T_{STG}	Storage Temperature Range	-40		125		
T_C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M6	3	5	N.m
Wt	Package Weight				250	g

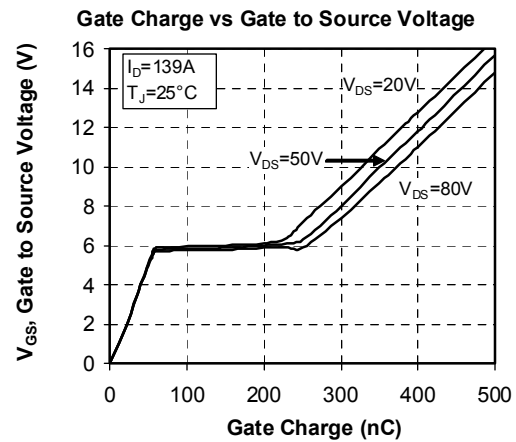
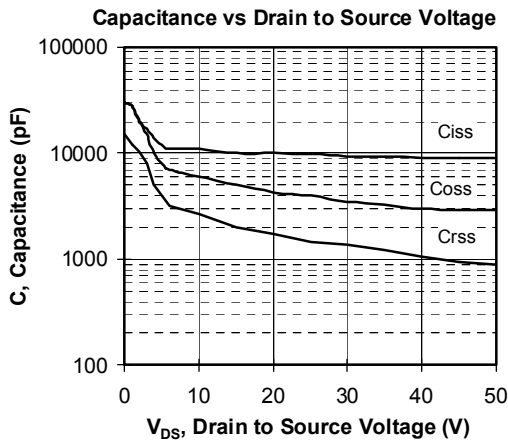
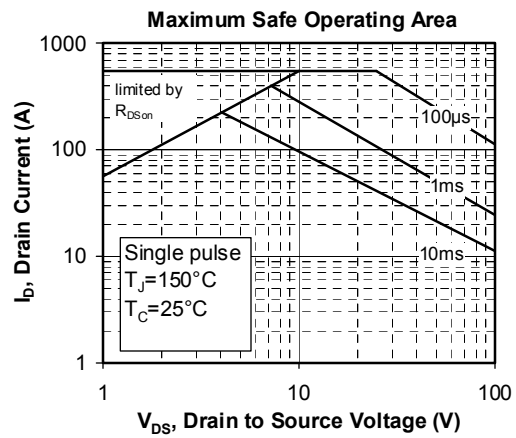
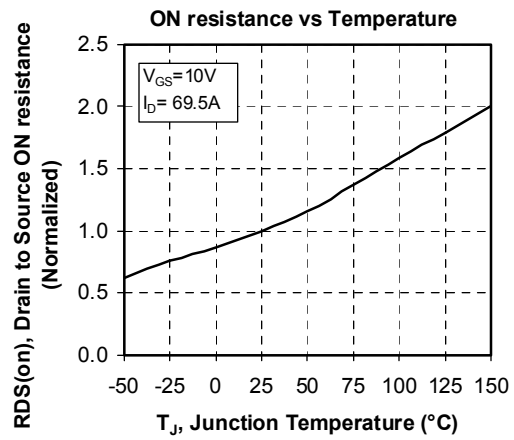
SP6-P Package outline (dimensions in mm)

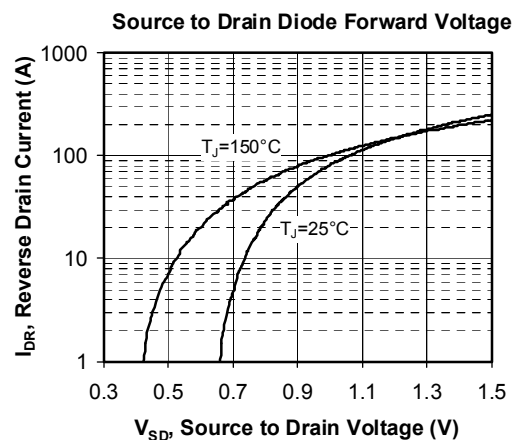
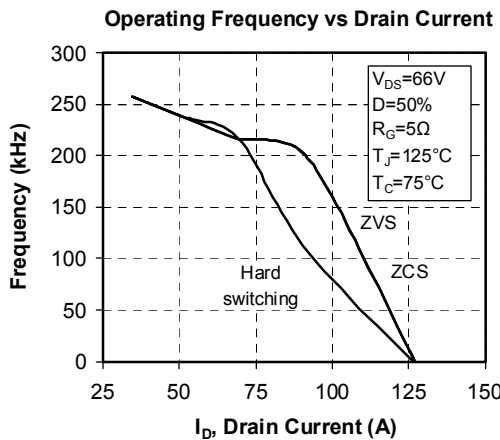
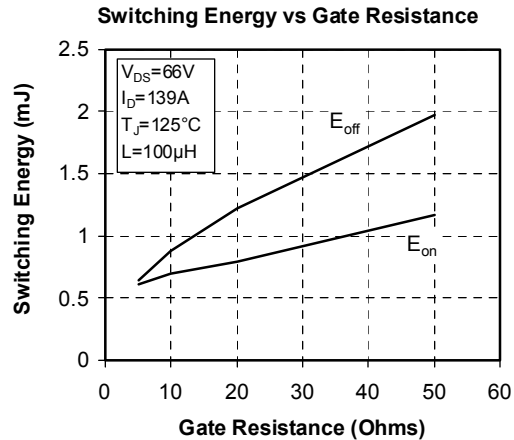
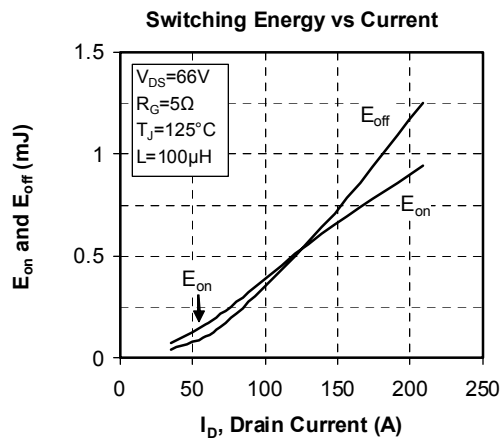
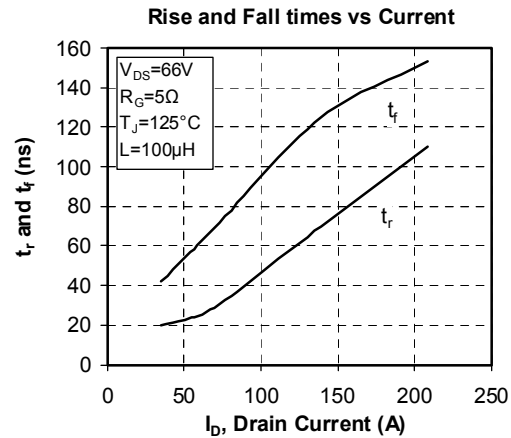
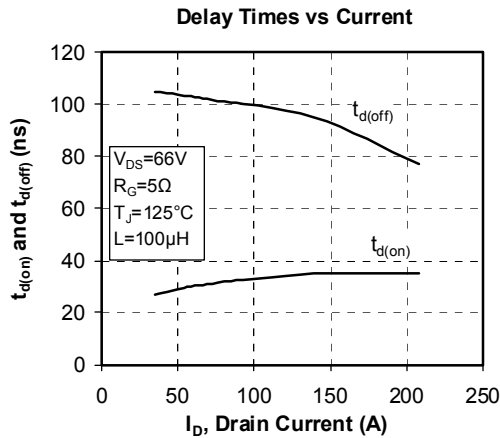


See application note 1902 - Mounting Instructions for SP6-P (12mm) Power Modules on www.microsemi.com

Typical Performance Curve







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